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**UNITED STATES DISTRICT COURT  
 NORTHERN DISTRICT OF CALIFORNIA  
 SAN FRANCISCO DIVISION**

JOHN TREANOR, Individually and on  
 Behalf of All Others Similarly Situated,  
 Plaintiff,

vs.

(1) MICRON TECHNOLOGY, INC.,  
 (2) MICRON SEMICONDUCTOR  
 PRODUCTS, INC.,  
 (3) MICRON CONSUMER PRODUCTS  
 GROUP, INC.,  
 (4) SAMSUNG ELECTRONICS CO., LTD.,  
 (5) SAMSUNG SEMICONDUCTOR, INC.,  
 (6) SK HYNIX, INC. (F/K/A HYNIX  
 SEMICONDUCTOR, INC.),  
 (7) SK HYNIX AMERICA, INC. (F/K/A  
 HYNIX SEMICONDUCTOR  
 AMERICA, INC.),  
 Defendants.

CASE NO.: 3:18-cv-3805

**COMPLAINT**

**CLASS ACTION**

**DEMAND FOR JURY TRIAL**

1 **I. INTRODUCTION**

2 1. This action is brought as a class action on behalf of a plaintiff class consisting of all  
3 persons and entities in the United States who purchased Dynamic Random Access Memory (“DRAM”)  
4 directly from the named defendants during the period from approximately June 1, 2016 through the  
5 present (the “Class Period”).

6 2. DRAM are high density, low-cost-per-bit, random access memory components that store  
7 digital information and provide high-speed storage and retrieval of data. DRAM is used in personal  
8 computers, servers, laptops, tablets, televisions, printers, cameras, cellphones, and in industrial  
9 applications, such as automotive, military, and aviation devices. DRAM is used as a storage module to  
10 hold data as it is processed. DRAM is sold in individual chips or as modules with several chips attached  
11 to the module.

12 3. Defendants are the leading manufacturers of DRAM, with a combined worldwide market  
13 share of approximately 95%.

14 4. As alleged in detail in this Complaint, this is a classic case of manufacturers in control of  
15 a commodity product with little to no price elasticity agreeing to limit their production and slow their  
16 capacity in order to increase prices. Immediately prior to and during the Class Period Defendants agreed  
17 to delay or slow capacity, or not to expand capacity at all. Defendants’ conduct was a marked departure  
18 from their conduct prior to the Class Period, and as Defendants intended, it stopped DRAM prices from  
19 falling and caused prices to increase dramatically.

20 5. Plaintiff, John Treanor, alleges that during the Class Period, Defendants conspired,  
21 combined and contracted to fix, raise, maintain, and stabilize the prices at which DRAM was sold in the  
22 United States. As a result of Defendants’ conduct, Plaintiff and the other members of the Class paid  
23 artificially inflated prices for DRAM during the Class Period. Such prices exceeded the amount they  
24 would have paid if the price for DRAM had been determined by a competitive market.

25 **II. JURISDICTION AND VENUE**

26 6. Plaintiff brings this action under §§ 4, 12, and 16 of the Clayton Act (15 U.S.C. §§ 15,  
27 22, and 26) for treble damages and injunctive relief, as well as reasonable attorneys’ fees and costs with  
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1 respect to the injuries sustained by Plaintiff arising from violations by Defendants of the federal antitrust  
 2 laws, including Section 1 of the Sherman Antitrust Act (15 U.S.C. § 1).

3 7. This Court has jurisdiction over this action pursuant to 28 U.S.C. §§ 1331, 1337(a) and  
 4 1367.

5 8. This Court has *in personam* jurisdiction over each of the Defendants because each  
 6 Defendant, either directly or through the ownership or control of its United States subsidiaries, inter alia:  
 7 (a) transacted business in the United States, including in this District; (b) directly or indirectly sold or  
 8 marketed substantial quantities of DRAM throughout the United States, including in this District; (c) had  
 9 substantial aggregate contacts with the United States as a whole, including in this District; or (d) were  
 10 engaged in an illegal price-fixing conspiracy that was directed at, and had a direct, substantial, reasonably  
 11 foreseeable and intended effect of causing injury to, the business or property of persons and entities  
 12 residing in, located in, or doing business throughout the United States, including in this District.  
 13 Defendants also conduct business throughout the United States, including in this District, and they have  
 14 purposefully availed themselves of the laws of the United States.

15 9. Venue is proper in this District pursuant to 15 U.S.C. §§ 15 and 22, and 28 U.S.C. §  
 16 1391(b) and (c), in that at least one of the Defendants resides in this judicial district, is licensed to do  
 17 business, or is doing business in this judicial district.

18 10. Assignment to the San Francisco Division of this District is proper under Civil Local  
 19 Rule 3-2(c) and (d) because a substantial part of the events or omissions which give rise to the claim  
 20 occurred in this county.

### 21 **III. THE PARTIES**

22 11. Plaintiff John Treanor is a resident of Los Angeles, California. During the class period,  
 23 Mr. Treanor purchased DRAM directly from one of the Defendants and/or their subsidiaries and  
 24 suffered injury as a result of Defendants' unlawful conduct. As a result of the conspiracy alleged herein,  
 25 Plaintiff has been injured in his business or property in that the price he paid for DRAM was artificially  
 26 raised, maintained or stabilized at a supra-competitive level by Defendants and their co-conspirators.

27 12. Defendant Micron Technology, Inc. ("Micron Technology") is a Delaware corporation  
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1 with its principal place of business at 8000 South Federal Way, Boise, Idaho. Micron Technology is a  
2 foreign stock corporation registered with the California Secretary of State and authorized to transact  
3 intrastate business in California. During the Class Period, Micron Technology manufactured, sold, and  
4 distributed DRAM throughout the United States.

5 13. Defendant Micron Semiconductor Products, Inc. (“Micron Semiconductor”) is an Idaho  
6 corporation located at 8000 South Federal Way, Boise, Idaho. Micron Semiconductor is a foreign stock  
7 corporation registered with the California Secretary of State and authorized to transact intrastate  
8 business in California. Micron Semiconductor is a wholly owned and controlled subsidiary of Micron  
9 Technology. During the Class Period, Micron Semiconductor sold and distributed DRAM to customers  
10 throughout the United States.

11 14. Defendant Micron Consumer Products Group, Inc. (“Micron Consumer”) is a Delaware  
12 corporation located at 8000 South Federal Way, Boise, Idaho 83716. Micron Consumer is a foreign  
13 stock corporation registered with the California Secretary of State and authorized to transact intrastate  
14 business in California. Micron Consumer is a wholly owned and controlled subsidiary of Micron  
15 Technology. During the Class Period, Micron Consumer sold and distributed DRAM to customers  
16 throughout the United States. Micron Consumer is the “consumer-facing entity of Micron Technology.”  
17 The Micron Consumer name brought several entities—Lexar Media, Inc. (U.S.); Crucial Technology  
18 (U.S.); Lexar Media (EMEA region); Lexar Media (APAC region); and Lexar Media (Japan) under one  
19 name as of July 17, 2012. Micron Consumer sells, among other things, Crucial-branded DRAM in the  
20 U.S. via [www.crucial.com](http://www.crucial.com). Crucial is a Micron Technology brand.

21 15. Defendants Micron Technology, Micron Semiconductor, and Micron Consumer are  
22 collectively referred to herein as “Micron.”

23 16. Defendant Samsung Electronics Co., Ltd. (“SEC”) is a Korean corporation and maintains  
24 its executive offices at 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, Korea. During the  
25 Class Period, SEC manufactured, sold and distributed DRAM throughout the world, including the  
26 United States.

27 17. Defendant Samsung Semiconductor, Inc. (“SSI”) is a California corporation located at  
28

3655 North First Street, San Jose, California 95134. SSI is a wholly owned “multi-billion dollar subsidiary” of SEC. During the Class Period, SSI sold and distributed DRAM throughout the United States.

18. Defendants SEC and SSI are collectively referred to herein as “Samsung.”

19. Defendant SK Hynix, Inc. (f/k/a Hynix Semiconductor, Inc.) (“SK Hynix Korea”) maintains its head offices at 2091, Gyeongchung-daero, Bubal-eub, Icheon-si, Gyeonggi-do, Korea. SK Hynix Korea “is the second-largest memory chip manufacturer in the world, leading the global memory semiconductor market and the sixth-largest company in the semiconductor field.” SK Hynix Korea’s “main products are DRAM and NAND flash.” During the Class Period, SK Hynix Korea manufactured, sold and distributed DRAM throughout the world, including the United States.

20. Defendant SK Hynix America, Inc. (f/k/a Hynix Semiconductor America, Inc.) (“SK Hynix America”) is a California corporation located at 3101 North First Street, San Jose, California 95134. SK Hynix America is a wholly owned and controlled subsidiary of SK Hynix Korea. During the Class Period, SK Hynix America sold and distributed DRAM throughout the United States.

21. Defendant SK Hynix Korea and SK Hynix America are collectively referred to herein as “SK Hynix.”

22. Micron, Samsung, and SK Hynix are collectively referred to herein as “Defendants.”

#### **IV. AGENTS AND CO-CONSPIRATORS**

23. Various other individuals, partnerships, corporations, and other business entities, unknown to the Plaintiff, have participated in the violations alleged herein and have performed acts and made statements in furtherance thereof. Plaintiff reserves the right to name some or all of these persons as defendants at a later date.

24. The acts charged in this complaint have been done by Defendants or were ordered or done by Defendants’ officers, agents, employees, or representatives, while actively engaged in the management of Defendants’ affairs.

25. Whenever in this complaint reference is made to any act, deed, or transaction of any corporation, the allegation means that the corporation engaged in the act, deed or transaction by or

through its officers, directors, agents, employees or representatives while they were actively engaged in the management, direction, control or transaction of the corporation's business or affairs.

26. Each Defendant or co-conspirator acted as the principal, agent, or joint venture of, or for, other Defendants and co-conspirators with respect to the acts, violations, and common course of conduct alleged by Plaintiff. Each Defendant and co-conspirator that is a subsidiary of a foreign parent acts as the United States agent for DRAM made by its parent company.

## **V. CLASS ACTION ALLEGATIONS**

27. Plaintiff brings this action both on behalf of himself and as a class action pursuant to Federal Rules of Civil Procedure, Rule 23(a) and (b)(3), on behalf of the following class:

All individuals and entities who, during the period June 1, 2016 through the present, purchased DRAM in the United States directly from one or more of the Defendants, their subsidiaries, or their affiliates. Excluded from the Class are Defendants and their parents, subsidiaries, affiliates, all governmental entities, and co-conspirators.

28. Plaintiff does not know the exact number of class members because such information is in the exclusive control of Defendants. Plaintiff believes that, due to the nature of the trade and commerce involved, there are likely thousands of class members, geographically dispersed throughout the United States such that joinder of all class members is impracticable.

29. Plaintiff's claim is typical of the claims of the class in that Plaintiff is a direct purchaser of DRAM, all class members were damaged by the same wrongful conduct of Defendants and their co-conspirators as alleged herein, and the relief sought is common to the class.

30. Numerous questions of law or fact arise from Defendants' anticompetitive conduct that are common to the class. Among the questions of law or fact common to the class are:

a. Whether Defendants engaged in a contract, combination or conspiracy among themselves to fix, maintain, or stabilize the prices for DRAM sold in the United States;

b. Whether Defendants engaged in a contract, combination, or conspiracy to restrict output of DRAM sold in the United States;

c. Whether Defendants restricted output of DRAM sold in the United States and committed other conduct in furtherance of the alleged conspiracy;

d. Whether the conduct of Defendants caused prices of DRAM sold in the United

1 States to be artificially inflated to non-competitive levels; and

2 e. Whether Plaintiff and other members of the class were injured by the conduct of  
3 Defendants and, if so, the appropriate class-wide measure of damages and appropriate injunctive relief.

4 31. These questions of law or fact are common to the class, and predominate over any other  
5 questions affecting only individual class members.

6 32. Plaintiff will fairly and adequately represent the interests of the class in that Plaintiff is a  
7 direct purchaser of DRAM from one of the Defendants and has no conflicts with any other member of  
8 the class. Furthermore, Plaintiff has retained competent counsel experienced in antitrust and class action  
9 litigation.

10 33. A class action is superior to the alternatives, if any, for the fair and efficient adjudication  
11 of this controversy.

12 34. Prosecution of separate actions by individual class members would create the risk of  
13 inconsistent or varying adjudications, establishing incompatible standards of conduct for the Defendants.

14 35. Injunctive relief is appropriate as to the class as a whole because Defendants have acted  
15 or refused to act on grounds generally applicable to the class as a whole.

16 36. Plaintiff reserves the right to expand, modify, or alter the class definition in response to  
17 information learned during discovery.

18 **VI. TRADE AND COMMERCE**

19 37. During the Class Period, Defendants, or one or more of their subsidiaries, sold and  
20 shipped substantial quantities of DRAM in the United States in a continuous and uninterrupted flow of  
21 interstate and international commerce to customers, including through and into this judicial district.

22 38. The business activities of Defendants that are the subject of this complaint were within  
23 the flow of, and substantially affected, interstate trade and commerce in the United States and caused  
24 antitrust injury in the United States.

25 39. During the Class Period, Defendants collectively controlled a majority of the market –  
26 approximately 95% – for DRAM, both globally and in the United States.

## **VII. STATEMENT OF FACTS**

### **A. What is DRAM?**

40. DRAM is one of the most common forms of semiconductor memory, a vital component in modern digital electronics. Composed of silicon wafers, DRAM are high density, low-cost-per-bit, random access memory components that store digital information and provide high-speed storage and retrieval of data used in personal computers and servers, laptops, tablets, televisions, printers, cameras, cellphones, and in industrial applications, such as automotive, military, and aviation devices. DRAM is used as a storage module to hold data as it is processed. DRAM is sold in individual chips or as modules with several chips attached to the module.

41. DRAM stores each “bit” of data in a separate capacitor within an integrated circuit. The “bit” is the basic unit of information stored in DRAM. A key attribute of a DRAM chip is its density—the amount of information it can store in the tiny circuits etched into its silicon surface. This attribute makes it very attractive for use in digital electronics and also in industrial applications.

42. “RAM” or “Random Access Memory” is the information storage or memory in a computer that stores running programs and data for the programs. Data (information) in the RAM can be read and written quickly in any order. Normally, the RAM is in the form of computer chips, such as DRAM.

43. Each capacitor on a DRAM chip can be either charged or discharged; these two states are taken to represent the two values of a bit, conventionally called 0 and 1. Since even “non-conducting” transistors always leak a small amount, the DRAM capacitors will slowly discharge, and the information eventually fades unless the capacitor charge is refreshed periodically. Because of this refresh requirement, it is a dynamic random-access memory as opposed to static random-access memory (SRAM) and other static types of memory. Unlike flash memory, DRAM is volatile memory (vs. non-volatile memory), since it loses its data quickly when power is removed. However, DRAM does exhibit limited data remanence.

### **B. DRAM Industry: Background**

44. The DRAM industry is a multi-billion dollar industry. The DRAM market grew to \$73



1 billion in revenue in 2017, a growth rate of 77%. In the first quarter of 2018, Samsung achieved revenue  
2 of a record-high \$10.36 billion from global DRAM sales. Defendants are the world's largest  
3 manufacturers of DRAM.

4 45. The DRAM market is highly concentrated, with just three companies dominating the  
5 industry. Defendants Samsung, Micron, and SK Hynix grew their combined market share from "just  
6 under 60% in 2007 to 95% in Q2 [of] 2017."

7 46. Defendants control the DRAM supply globally and their customers require a certain  
8 amount of DRAM for their products to work, thus DRAM is a "sellers' market." "Device manufacturers  
9 need a certain amount of DRAM to meet performance requirements for systems that they may have  
10 worked on developing several quarters ago. This forces companies to buy DRAM irrespective of higher  
11 prices, without being able to meaningfully scale back."

12 47. DRAM is a commodity. Price quotes depend on supply and demand for the most part  
13 rather than on technological advantages. Like other electronic product markets that have been the subject  
14 of antitrust investigations (Cathode Ray Tubes, Lithium Ion Batteries, and Capacitors), the DRAM  
15 market has characteristics that make it susceptible to collusion, including: (a) a concentrated market  
16 dominated primarily by a few companies (here the three Defendants control approximately 95% of the  
17 market); (b) significant barriers to entry; (c) inelastic demand for the products at issue; (d) standardization  
18 or commoditization of products; (e) avenues that allow the Defendants to exchange or signal competitive  
19 information; and (f) pricing behavior that is inconsistent with a competitive market.

20 48. For example, Defendants had many chances to collude through common participation in  
21 trade associations and industry groups, and through their overlapping business relationships. Defendants  
22 could also track and monitor each other's price and supply movements, before the public could do so,  
23 through DRAMeXchange – an industry mechanism tracking Defendants' pricing and capacity  
24 movements, to which Defendants all subscribed.

25 **C. Defendants' Pre-Class Period Conduct**

26 49. In the years prior to the class period, Defendants made independent, competitive  
27 decisions regarding supply and capacity, which led to declining DRAM prices.  
28

1           50. For example, on Samsung's second quarter earnings call on July 31, 2014, Samsung  
2 noted its expectation for its bit growth to be higher than the industry: "For DRAM our bit growth in  
3 second quarter was approximately 20% q-on-q and we expect for the third quarter the market DRAM  
4 bit growth will come in at high single digit and we will outgrow the market's bit growth. At this point  
5 we expect the DRAM market bit growth for 2014 to be low 30% and we expect our bit growth for the  
6 year to be high 40%. The second quarter we experienced ASP decline of DRAM at low single digit."  
7 Samsung noted that "while the market demand remains strong, the suppliers weren't able to bring on  
8 additional supply much more other than us, and therefore we were in a very good position to capture  
9 this opportunity. That is resulting in the higher bit growth expectations that you have heard."

10           51. On Samsung's third quarter earnings call on October 30, 2014, Samsung stated its policy  
11 "that our bit growth rate next year should or would have to be higher than the industry. That is our  
12 goal." Samsung also noted in response to investor questions that "if we see the price to be very  
13 attractive, then we can use the idle capacity to increase our work in progress, which has helped us this  
14 year."

15           52. Again, on Samsung's fourth quarter earnings call on January 29, 2015, Samsung  
16 discussed its plans to exceed market growth: "For DRAM business in Q4, our bit growth was flat from  
17 Q3 as well as ASP which was also flat. For the first quarter 2015 for DRAM bit growth, we expect both  
18 market and Samsung Electronics to be flat from Q4. We are expecting about mid 20% bit growth for  
19 market growth for DRAM and our bit growth we believe will outgrow that of the market growth."

20           53. In response to investor questions, Samsung noted that "a shortage in the industry would  
21 be great news. I don't think a shortage will happen overnight. We will have signs to indicate a shortage  
22 coming forward, and so if we do see such signs such as the economy picking up or orders for other  
23 components picking up, I am sure – looking at all of the resources that we have, not only in our side but  
24 also in the overall semiconductor side, personally I think that we will find a way of capturing any  
25 shortage opportunities if they do materialize." Samsung reiterated its plans to outgrow the industry: "the  
26 main reason why we are planning and expecting to outgrow the industry is because we have better  
27 productivity compared to our competitors based on our technology leadership in terms of the  
28

1 manufacturing. That is the main reason why we're expecting to outgrow the industry."

2 54. DRAmEXchange reported that DRAM prices declined from October 2014 to June 2016,  
3 with "the average contract price of DDR3 4GB plunging 62% from US\$32.75 to US\$12.5."

4 **D. From 2015, Micron Made Public Comments, Calling for Supply Restrictions**

5 55. From 2015, Micron made public comments, inviting its competitors to stop adding  
6 significant capacity, and Samsung and SK Hynix responded.

7 56. At the UBS Global Technology Conference on November 17, 2015, Micron CFO Ernie  
8 Maddock recognized that Micron was in "an environment where you have closely held technology by a  
9 very limited number of producers." Maddock noted that "you're seeing some really rational decisions"  
10 and that "we don't foresee a reason that there would be any significant DRAM capacity expansion."

11 57. On Micron's first quarter 2016 earnings call on December 22, 2015, Mark Durcan,  
12 Micron's then-CEO, similarly noted that "[t]he DRAM industry consist[s] of only three technology  
13 developers, based on current long-term outlook we foresee technology driven supply growth slowing  
14 and can envision a future in which no additional DRAM wafer capacity is required." Micron estimated  
15 that "industry bit supply growth will be in a low 20% range in 2016, in line with demand and that  
16 industry fundamentals will remain healthy over the long-term."

17 58. In early 2016, DRAM prices were still falling with Micron reporting a "30% decline in  
18 revenue was paired with a quarterly loss." Reports noted "Micron's financial performance going  
19 forward is going to depend heavily on DRAM pricing, and it will take a stabilization of prices before  
20 Micron is able to return to earnings growth. Unfortunately for the company, there's not much reason to  
21 believe that DRAM prices will improve anytime soon." Analysts noted Samsung's past "aggressive  
22 behavior," with its focus on expanding its market share in DRAM. One commentator even noted that  
23 Samsung may be "the sole survivor in DRAM" as a result of its competitive behavior.

24 59. On Micron's second-quarter earnings call on March 30, 2016, when questioned about the  
25 likelihood of the company cutting production to ease supply, Micron's then-CEO Mark Durcan stated  
26 "we think we would be foolish to be the first ones to take capacity off," while Micron CFO Ernie  
27 Maddock stated "it's a really ill-advised move to be unilaterally cutting production." Mr. Durcan also  
28

1 signaled that Micron would not try to take market share from its competitors: “Our focus isn’t on market  
2 share. Our focus is on making sure that we’ve deployed equivalent advanced technology, at least  
3 equivalent advanced technology to our competitor, so that we’re not incentivizing others to play for  
4 market share.”

5 60. SK Hynix reported a 17% fall in revenue from the previous quarter in March 2016. While  
6 analysts suggested that Samsung appeared to be engaging in a competitive price war, SK Hynix  
7 announced its plans for “a below-industry growth rate while protecting its unit sales prices.”

8 **E. In 2016, Defendants Changed Their Behavior, Responding to Micron’s Invitations**  
9 **to Restrict Supply**

10 61. Within a month of Micron’s statements, Samsung announced at its first-quarter earnings  
11 call on April 28, 2016 that “For DRAM business in Q1 this year, our bit growth was negative low single  
12 digit with low teens of ASP decline.” In response to investor questions, Samsung noted: “We don’t  
13 expect there to be major increases in supply of DRAM in the near future. . . . And we will in terms of  
14 full year 2016 DRAM shipment we expect to be in line with the market growth.”

15 62. At the JP Morgan Global Technology, Media and Telecom Conference on May 25, 2016,  
16 Micron’s then-CEO Mark Durcan noted that “bit growth next year will be 20%-ish” “as long as nobody  
17 adds any incremental DRAM wafers,” and “[i]f wafers actually come down as we’re starting to hear  
18 some equipment suppliers talk about, then it could be mid- to high-teens, in which case that would be  
19 more beneficial.” Durcan noted that, in 2014, Samsung “added some wafers probably more than they in  
20 retrospect would have . . . I don’t think the intention was to oversupply the market. But following that,  
21 we had a fairly significant decline over the last couple of years ....” He continued “we all are going to  
22 either benefit or be hurt by excess supply in the marketplace.” Durcan stated that he expected  
23 Defendants to maintain discipline with regard to bit growth: “there’s a natural tightening tendency  
24 absent, somebody wanting to do something different than that. And so I’m – I actually remain bullish on  
25 the long term value, the DRAM business and the actions of the competitors in the marketplace.”

26 63. On May 26, 2016, the World Semiconductor Council’s 20th Anniversary Meeting took  
27 place in Seoul, South Korea. Park Sung-wook, CEO of SK Hynix was one of six chairmen of the World  
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1 Semiconductor Council. The meeting was attended by representatives from China, Taiwan, the EU,  
 2 Japan, the U.S., and Korea. Samsung Electronics was one of those in attendance, with one Samsung  
 3 attendee quoted in media reports following the meeting. Just days before the start of the class period,  
 4 representatives of at least two Defendants had a clear opportunity to communicate directly. Defendants  
 5 are also all members of the United States' Semiconductor Industry Association, which appoints  
 6 delegates as members of the World Semiconductor Council.

7 **F. During the Class Period, Defendants' Agreement to Restrict DRAM Supply Led to**  
 8 **Rising DRAM Prices**

9 64. As alleged in detail below, immediately prior to and during the Class Period Defendants  
 10 agreed to delay or slow capacity, or not to expand capacity at all. This coordination aided Defendants'  
 11 efforts to stop DRAM prices from falling and caused prices to dramatically reverse course. One method  
 12 Defendants used to effectuate their agreement was to communicate their shared intentions to limit DRAM  
 13 capacity through public statements, and each taking the agreed upon actions in response.

14 65. Defendants made statements in earnings calls, press releases, media, or other public  
 15 documents and monitored each other's plans.

16 66. Defendants' statements about capacity discipline, limiting production or supply, not  
 17 increasing supply/capacity, slowing growth in capacity or supply, etc. represented a deviation from past  
 18 business practices.

19 67. By reassuring each other through these communications, Defendants demonstrated each  
 20 was committed to maintaining capacity and supply discipline in the midst of steady increases in demand  
 21 and rising prices – unlike in 2014, and contrary to their individual interest in increasing market share and  
 22 short-term profits,

23 68. In fact, Defendants' conspiratorial conduct was extremely effective in causing DRAM  
 24 prices to climb sharply from the middle of 2016 to the present. During this period of time, DRAM spot  
 25 prices rose approximately 350% – an increase totally unique compared to DRAM's prior pricing history.  
 26 Defendants, as a result, reaped huge profits during the Class Period.

27 69. Defendants' illegal behavior, alleged herein, artificially stabilized and raised the prices  
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1 of DRAM during the Class Period. As a result, DRAM prices were higher than they would have been  
2 absent the conspiracy.

3 70. After several public statements by Micron regarding the need to limit capacity, in 2016,  
4 Samsung responded to Micron's invitations and abruptly changed its behavior. Rather than aggressively  
5 pursuing market share, Samsung changed focus. On January 29, 2016, Samsung, at its fourth quarter  
6 2015 earnings call forecasted growth in line with the market for the coming year: "For 2016, for the  
7 whole year, the DRAM market bit growth, we expect mid-20%, and our bit growth is expected to grow  
8 align with the market." Samsung also announced its plans to move away from its aggressive market  
9 share approach to focus "on maintaining our market leadership rather than own growth and continue to  
10 expand the sales of high value-added and differentiated products."

11 71. On June 16, 2016, Micron's CFO Ernie Maddock reassured analysts at the NASDAQ  
12 Investor Program Conference—in response to a question about Samsung's "disruptive" behavior—that  
13 "this idea that there is a general reduction in DRAM CapEx planned by our Korean competitors and that  
14 we believe is very consistent with other messages that we're hearing in the marketplace. So am I  
15 concerned? We're always concerned. Do we believe that that disruptive behavior is a high likelihood? It  
16 just doesn't feel as if that's the case right now."

17 72. From June 2016 onwards, DRAM prices increased, yet each Defendant limited bit growth  
18 by not adding significant wafer capacity and consistently communicated their plans to grow in line with  
19 the market rather than pursuing market share.

20 73. On SK Hynix's July 21, 2016 second quarter earnings call, SK Hynix stated "DRAM bit  
21 shipment growth is expected to be in the high single digit in the third quarter, which will make the  
22 shipment growth for the year to be low to mid 20%, in line with market growth."

23 74. Just seven days later, at its July 28, 2016 earnings call, Samsung reiterated its plan to  
24 grow in line with the market, predicting very similar growth to SK Hynix: "For the third quarter, we  
25 expect the DRAM market bit growth to be mid-teens and we will grow along with the market. And at  
26 this point, we expect 2016 DRAM market bit growth to be mid-20%, and we will grow in line with the  
27 market."  
28

1           75. Industry analysts noted “a sudden market upturn began in the second half of” 2016. “To a  
2 large extent, the chip market is booming more than expected thanks to a sustained surge in memory chip  
3 pricing driven by tight supply. IC Insights said the DRAM market is now expected to grow by 55  
4 percent this year, while the market for NAND flash is now expected to grow by 35 percent. In both  
5 cases, the sales increases are being driven almost entirely by price increases rather than unit growth.”

6           76. At the Citi Global Technology Conference on September 8, 2016, Micron CFO, Ernie  
7 Maddock noted: “there are again an increasing number of data points to suggest that you’re going to see  
8 very little wafer addition, if any.” When asked if Micron would change their supply plans in response to  
9 improving demand, Maddock reiterated their commitment to the common plan: “Well, I mean we have  
10 basically announced what we intend to do in terms of bit growth and we’re sticking to that.” In response  
11 to a question as to whether he foresaw any of the producers increasing wafer capacity, Maddock noted:  
12 “while I would love to tell you that our competitors have sent us a memo telling us what their expansion  
13 plans are, unfortunately I can’t report that, but certainly we read the same thing that each of you read  
14 and it does suggest that the focus of capital spend in 2017 is going to be NAND as opposed to DRAM  
15 on the part of many folks in the competitors face. And as I mentioned, we would expect all of our bit  
16 growth to come from technology transition as opposed to any sort of wafer expansion. There have been  
17 some pretty dramatic things published which I won’t repeat here relative to potentially what’s going on  
18 with some of our competitors and how they’re choosing to use their productive capacity, but there’s no  
19 sign anywhere in the market that suggests there’s a plan to expand DRAM wafer capacity.”

20           77. By October 2016, Micron was reporting “better-than-expected” fourth quarter revenue.  
21 Analysts noted that “[w]ith DRAM prices rebounding to 7 month highs, Micron is benefiting as the  
22 supply glut in the market has dried up following aggressive cut backs in production amid signs of a  
23 bounce back in demand.” Micron’s then-CEO Mark Durcan said “We are seeing marketing conditions in  
24 terms of both slowing supply growth and improving demand across key segments.”

25           78. On Micron’s October 4, 2016 earnings call, Mr. Durcan noted “we’ve seen further  
26 evidence that DRAM wafer output is declining as a result of lost throughput related to the 20-nanometer  
27 and 1X nanometer conversions. Absent some replacement of these wafers, we could see industry supply  
28



1 growth as low as mid-teens in 2017. As some of lost wafer output is replaced, industry supply growth  
2 could be in the high-teens percent range. This compares to our long-term bit demand growth forecast in  
3 the low to mid 20% range.”

4 79. In its October 27, 2016 earnings call, Samsung again noted that its bit growth rates would  
5 “be in line with market bit growth in DRAM next year. Once again, as we have always mentioned,  
6 regarding DRAM, our focus is not to increase our market share but to maximize our profits.” In  
7 response to a question on the potential to add wafer capacity, Samsung reiterated its position:  
8 “Regarding the DRAM, once again, our bit growth will be focused more on process migration. And so  
9 as we have mentioned, we will be focusing on quickly and flexibly responding to the market  
10 environment as it unfolds.” Reiterating again, in response to another question, “And once again, in terms  
11 of our DRAM business, our basic approach [is] that we will be more profitability-oriented than market  
12 share-oriented and we plan to next year, at this point, expect to grow at market level.”

13 80. In response to investor questions regarding investment and capacity plans for DRAM,  
14 Samsung reiterated that although they would be executing “supplementary investment on the remaining  
15 space of Line 17,” “this is not to increase capacity, but to supplement and make up for the natural  
16 capacity decrease that we experience as we migrate towards 1X.” Continuing, “Currently we have no  
17 plans of increase – or adding a DRAM capacity to the Pyeongtaek campus.”

18 81. At the Credit Suisse Technology Media & Telecom Conference on November 29, 2016,  
19 Ernie Maddock, Micron’s CFO noted “I think a lot of that confidence goes back to the fundamental  
20 view of this supply and this demand. With no way for additions, we are increasingly present that you  
21 are going to see this supply grow, at something less than 20%, and even with some room for error on  
22 the DRAM with demand side, we still see a number there north of 20%.” He continued “our objective  
23 is to close the gap and make it as narrow as reasonable without doing anything that would potentially  
24 be disruptive to our performance or the industry’s performance.”

25 82. At the Barclays Technology Conference on December 7, 2016, Micron’s Ernie Maddock  
26 recognized the change in Samsung’s behavior, noting that the “absence of capacity additions” meant the  
27 industry was now “back into this fundamentally healthier period.” Mr. Maddock also forecast that  
28



1 supply would grow slower than demand: “So as we look at the supply side of the house, somewhat  
2 between 15% and 20% supply growth coming from these technology transitions and that is against a  
3 demand environment that we think is going to grow somewhere in the range of 20% to 25% on a bip  
4 basis.”

5 83. On Micron’s earnings call on December 21, 2016, Micron’s then-CEO Mark Durcan  
6 differentiated the current situation from that seen in 2014 and indicated that Samsung had learned from  
7 its mistakes in 2014: “Well I think that part of what happened in the last latter stages of the last cycle  
8 where perhaps a little bit a miscalculation by one of the suppliers, but that they probably learned from so  
9 there is that.” He continued that Micron “had no plans to add new wafers this year.” In response to  
10 investor questions concerning additional capacity, he noted “We don’t have great crystal ball as to where  
11 our competitors are doing. We read the same reports that you guys read. All of that plus all the other  
12 internal intelligence we can generate that baked into our ranges and in the data sheet that we provided.  
13 So I think there has been some chatter recently potentially about few incremental wafers from one of the  
14 suppliers. Our view of that is if that were to happen, it’s a relatively minor adjustment in terms of the  
15 overall scope of the bit growth that we’re projecting and it would probably not cause us to change that  
16 range that we’ve giving you.”

17 84. Industry analysts noted in early 2017 that while the global increase in DRAM bit demand  
18 was expected to surpass 20% in 2017, global DRAM bit supply—which is almost entirely controlled by  
19 Defendants—was expected to grow by just 19% in 2017.

20 85. At the Needham Growth Conference on January 10, 2017, Micron’s CFO Ernie  
21 Maddock, discussed Micron’s confidence that its competitors would not increase supply: “I think their  
22 comments need to stand on their own and their comment seems to suggest a rational approach to  
23 addressing the supply/demand constraints of the DRAM market.” Maddock repeated Micron’s  
24 commitment to the common plan: “Our review of the DRAM business is that there will be somewhere  
25 between 15% and 20% bit supply from Micron and all the other participants in the industry. And then  
26 from a demand point of view, we think demand is going to be somewhere a little bit north of 20%, so  
27 somewhere between 20% and 25%.”  
28

1           86.     At its fourth quarter earnings call for 2016, Samsung again committed to limit its bit  
 2 growth in line with the market: “For Q1 2017, we expect the DRAM market bit growth to decline high-  
 3 single digit and our bit growth will decline low-teens. For 2017, whole year, we expect year-end bit  
 4 growth to be high-teens and our bit growth will be similar level.” In response to an investor question  
 5 concerning Samsung’s ability to boost capacity, Samsung reiterated its focus on technology migration,  
 6 explaining “we believe we are able to cover the current market demand through our technology  
 7 migration. So that is why we will be maintaining our operation flexibly and try to cover the market  
 8 demand within our technology migration. So, given the size as well as the lead time necessary for  
 9 increase of DRAM capacity, we believe that temporary increase of DRAM supply is not very easy.”

10           87.     On January 25, 2017, SK Hynix announced its plans for “a DRAM bit shipment growth  
 11 that is on par with the market for this year.” SK Hynix similarly warned that “DRAM chip supply  
 12 growth may not keep up with demand.”

13           88.     On February 1, 2017, Moody’s Senior Analyst and Vice President, Gloria Tsuen,  
 14 supported SK Hynix’s positive rating outlook, noting that “SK Hynix’s 4Q 2016 results continued to  
 15 show pricing recovery in DRAM, amid strong demand and disciplined industry supply.”

16           89.     In March 2017, Micron’s then-CEO Mark Durcan spoke to a reporter for Barron’s about  
 17 supply levels:

18           Durcan said in response to my question of whether a whole bunch of new supply will enter  
 the market, “We don’t see that happening right now.”

19           “As best we can tell, when we put all that we know in our own model, there is not a big  
 20 new wave of supply coming.”

21           Of course, “Further out, you get less certainty,” he conceded, “because people can add  
 22 wafers, but right now, there are fairly long lead times on equipment, so that’s not going to  
 happen any time soon.”

23           He added, “There are not enough new wafers coming to create oversupply.”

24           90.     On March 9, 2017, Micron’s CFO Ernie Maddock reiterated the same growth forecast of  
 25 “15% to 20% bit growth in supply and 20%, 25% sort of intrinsic demand growth” at the Susquehanna  
 26 Semi, Storage, & Technology Conference. Maddock noted “But at the end of the day, it has typically  
 27 not been Micron who has expanded industry capacity when the margin profile upgrade . . . all of the  
 28

1 statements and all of the actions thus far suggest the things may indeed different in terms of how the  
2 participants are thinking about, the balance of profitability versus market share.” Maddock reiterated  
3 that Micron is “public about the fact that we have no current plan to add wafers in any form.”

4 91. On March 23, 2017, Micron also reiterated an industry-wide forecast of bit supply  
5 growth between 15-20% and demand growth between 20-25%: “It’s still, in our view, it’s 15% to 20%  
6 supply growth this year, could actually be less than that if there’s less new wafers than we have in our  
7 plan. Demand is still 20% plus.” In response to a question as to whether Micron would add wafer  
8 capacity because of “such strong pricing out there in the market,” Micron’s then-CEO Mark Durcan  
9 responded: “We’re not focused on adding more supply . . . We do have white space in both our Fab 16  
10 in Taichung as well as Fab 10X, but we’re not planning any capacity additions this year.” In response  
11 to a question concerning Samsung expanding supply, Durcan explained, “Again, I think the last cycle  
12 was a little different with that instability in supply created by the Hynix fire. I don’t know why they  
13 would intentionally repeat the mistake from last cycle. They probably are enjoying making good  
14 margins . . . Samsung is actually probably on the low end over the next couple of years relative to  
15 what’s going on in the industry as a whole. And the industry as a whole is probably a little bit south of  
16 where we think demand growth is.”

17 92. On its April 24, 2017, first-quarter earnings call, SK Hynix reiterated that “the current  
18 projection for about 20% level growth is also based on the assessment of . . . all of the factors.”

19 93. At Samsung’s first-quarter earnings call for 2017 on April 27, 2017, Samsung confirmed  
20 their plan for their DRAM bit growth to be “aligned with the market.” “For DRAM in Q1, our bit  
21 growth declined low-teens, while ASP increased low-20%. For second quarter, we expect DRAM  
22 market bit growth to be mid-single digit increase and we expect our DRAM bit growth in second quarter  
23 to be high-single digit. And for the year, we expect DRAM market bit growth to be high-teens and we  
24 expect to grow in line with the market.” Again, in response to investor questions about capacity,  
25 Samsung repeated that “we have no plans of additional capacity,” other than to “make up for the loss  
26 that happens as we migrate to the 1X.” Samsung noted that “we’ve always had a very flexible capacity  
27 operation that optimizes the capacity for each product depending on the market situation that unfolds.”  
28

1           94.     In response to investor questions concerning the threat from Chinese manufacturers  
2 entering the DRAM market, Samsung stated that the memory market “it’s now protected by quite a high  
3 entry barrier, because memory business today requires not only the very cutting-edge processors  
4 migrated, but also needs to have various high value-add solutions to go with the products.”

5           95.     On May 24, 2017, Micron’s CFO, Ernie Maddock, at the JP Morgan Global Internet,  
6 Media and Technology Brokers Conference noted that Micron and its competitors—unlike previous  
7 years—were being careful not to add supply: “if you listen to the commentary coming from industry  
8 participants on the supply side it reflects a great deal of discipline and thoughtfulness with respect to  
9 how the industry participants are considering supply expansion . . . Although we don’t speak for the  
10 industry, the other participants have spoken and indicated a great deal of discipline.” Micron reiterated  
11 supply growth that matched that of its competitors: “on the DRAM side you’re going to see somewhere  
12 between 15% and 20% growth in bits supplied, that’s something that the other suppliers in the market  
13 are also saying, within reasonable range.” Micron also flagged that its plans to avoid adding wafer  
14 capacity were consistent with its competitors: “I think that’s reasonably consistent with certainly what  
15 we’ve said about our intent, and then certainly the public comments of the other industry participants  
16 have been pretty much exactly that. That while you do get some wafer loss as a result of technology  
17 transitions, the intent that we have is to maintain flat wafer outs, so essentially you are adding a little bit  
18 of capacity to make up for those lost wafer outs, but as an industry as a whole, you are not adding  
19 substantial incremental industry wafers and that would contribute to or allow you to get into this 15% to  
20 20% range in terms of bit growth.”

21           96.     On June 6, 2017 at the Bank of America Merrill Lynch 2017 Global Technology  
22 Conference, Ernie Maddock, Micron’s CFO, noted the consistent approach taken to limit supply across  
23 the industry: “And we feel that from a larger perspective over the course of a multi-year period, it feels  
24 as very much as if you’ll have good balance between supply and demand as long as capital discipline is  
25 exercised. And certainly Micron has indicated the difference to be reasonably disciplined with its capital  
26 investments, and other industry competitors in their particular public disclosure[s] have said similar  
27 things.” In response to questions as to how Micron expected competitors to act in the improved industry  
28

1 circumstances, Micron noted “I can say our view of industry bit demand will have to be materially  
2 different than in the peers to be today to begin to have a think about expanding capacity well beyond  
3 where we are thinking today which is predominantly to get that capacity through technology transition .  
4 . I don’t think our view of how we look at the industry is very – very different than how other rational  
5 smart people sitting and other competitors tend to look at the industry.”

6 97. At the Robert W. Baird Global Consumer Technology conference on June 8, 2017, Ernie  
7 Maddock, Micron’s CFO noted: “[T]here has actually been much more disciplined behavior on the part  
8 of the remaining industry participants, of which there are now only 3, it’s Micron, Samsung and Hynix.  
9 And so while each of us is assessing the market, looking at the market, I think there’s great consistency  
10 between suppliers relative to our view of market growth opportunities on the demand side. And what  
11 you see being exercised today is disciplined investment around expansion of capacity relative to  
12 expansion of demand. And each one of us has made our own independent comments on what we think  
13 makes sense for our particular company. In Micron’s case, we said that we have no plans for additional  
14 new wafer fab capacity that we will get the bits that we require to serve the market from technology  
15 transitions.”

16 98. On Micron’s June 29, 2017 earnings call, Micron President, CEO and Director Sanjay  
17 Mehrota noted Micron’s position that “for calendar 2017, we expect DRAM industry bit supply growth  
18 of between 15% and 20%, slightly below our view of demand growth.” In response to a question  
19 regarding Micron’s views on adding more DRAM wafer capacity, Mehrota reiterated Micron would  
20 focus on technology transitions instead of increasing capacity: “In terms of any new capacity, I mean,  
21 we would certainly have to first make sure that we have captured the maximum potential of our  
22 technology transition capability in manufacturing. And then we’ll have to certainly see that there is  
23 sustained projection or sustained demand growth in the years ahead before we consider adding new  
24 capacity.”

25 99. At SK Hynix’s second quarter earnings call on July 24, 2017, SK Hynix similarly stated  
26 its plan for DRAM bit shipment at “low 20% on par with the market.”

27 100. At Samsung’s earnings call on July 27, 2017, Samsung again stated its plan to keep its bit  
28

1 growth aligned with the market growth. “In the third quarter, we expect market DRAM bit growth to be  
2 high-single digit, and we expect our DRAM bit growth to be low-teens. And for the year, we expect the  
3 DRAM market bit growth to be high-teens, and we expect our bit growth to be aligned with the market  
4 growth.” Samsung recognized that “[d]ue to restriction of industry supply, supply and demand remained  
5 solid and price continued to rise.” In response to investor questions, Samsung reiterated again, that in  
6 contrast to its pre-Class Period aggressive market share focus, “we will refrain from, for example,  
7 increasing market share, fighting on volume. . . . we will flexibly manage our capacity by very closely  
8 monitoring the market situation, as well as the supply and demand balance.”

9       101. On August 7, 2017, Sanjay Mehrota, Micron’s CEO, repeated the same gap between  
10 supply and demand at the KeyBanc Capital Markets Annual Global Technology Leadership Forum  
11 Conference: “overall bit supply in the industry is in 15% to 20% range. And when you look at the bit  
12 supply growth perhaps, may be a little bit toward the higher end of that 15% to 20% range. But, the  
13 demand projection, again, from all the mega markets that I earlier talked about, point to greater than  
14 20% demand for the industry. So, I do believe that for 2017 and heading into 2018 as well, the industry  
15 fundamentals will be healthy.”

16       102. At the Citi 2017 Global Technology Conference on September 6, 2017, Micron CFO  
17 Ernie Maddock recognized the importance of consolidation to limiting the increase in capacity and  
18 reassured investors that this supply discipline would continue into 2018: “Relative to the supply side, I  
19 do think consolidation has been very instrumental in having a disciplined and orderly expansion of  
20 supply. We have certainly seen that now over period of a couple of years and we expect based on  
21 everything that we can see that you're going to continue to have a disciplined expansion of supply as we  
22 look forward into fiscal '18 for Micron.”

23       103. Maddock also reiterated the focus on keeping supply growth below demand growth:  
24 “Well, if you listen to the public commentary of the industry participants, the key message across the  
25 Board is that the investments are mainly for technology transition with the desire to keep wafer starts  
26 roughly flat . . . . But if you look at that, that will allow the industry to grow bits at this 20% plus or  
27 minus range over the course of any given year and certainly that feels very well matched to what we  
28

1 believe the demand to grow from a supply point of view, which is in the 20% to 25% range.”

2       104. On Micron’s fourth quarter 2017 earnings call on September 27, 2017, Micron told  
3 investors that it expected the “industry to remain moderately undersupplied for the rest of 2017 for . . .  
4 DRAM.” In response to questions as to when Micron would begin to outgrow the industry, Micron  
5 noted “I would also tell you that our objective over a multiyear period is to grow at about industry levels  
6 . . . really important is the segment that we intend to grow aligned with industry over the course of these  
7 multiyear periods.”

8       105. Similarly, SK Hynix reported on its earnings call on October 16, 2017 that it intended to  
9 grow its DRAM capacity “on par with the market” in 2018, even though the DRAM market was in a  
10 state of undersupply.

11       106. At Samsung’s earnings call on October 31, 2017, Samsung again signaled its plan to stay  
12 in line with the market. “For DRAM, in the third quarter, our bit growth came in high single-digit and  
13 our ASP grew high single-digit as well. For the Q4, we expect market DRAM bit growth to be low  
14 single-digit and we expect our growth to be similar. That will bring the 2017 market DRAM bit growth  
15 to be approximately 20% and our bit growth will be mid-teens.” Samsung again reiterated that it would  
16 maintain its “profit first rather than market share policy.” In response to investor questions, Samsung  
17 noted that its “basic approach to DRAM capacity management is that we will flexibly manage our  
18 capacity especially depending on the market situation for each product, as well as the migration in the  
19 10-nano class process technology.” Samsung also noted that despite a prior decision “to convert part of  
20 Hwaseong NAND capacity to DRAM . . . because of the inefficiencies that are caused as a result of this  
21 conversion, we have actually decided to reduce the size of the NAND conversion to DRAM than  
22 originally planned and rather use part of the upper floor of Pyeongtaek for DRAM capacity.”

23       107. When discussing Samsung’s investments in their semiconductor business, Samsung again  
24 signaled its commitment to limiting capacity in the DRAM market, noting that “the investments we’re  
25 making this year and next year in our Semiconductor business is not for immediate bit growth next year.  
26 We actually have a longer term horizon. We think that the investments that we’re making now and next  
27 year is more for the overall business capabilities for the next two to three years.”  
28



1           108.   Contrary to Samsung's pre-Class Period aggressive fight for market share, by 2017  
2 Samsung had lost market share, yet still focused on maintaining bit growth at market growth levels. In  
3 response to a direct investor question as to whether Samsung planned "to regain its previous market  
4 share next year or will you be more trying to maintain where you stand currently?" Samsung again  
5 reiterated its commitment to avoiding competition for market share: "the current guidance that we can  
6 give you is that for next year, our bit growth for DRAM is expected to be at market growth levels." The  
7 'declining market shares of leaders' is a plus factor potentially indicative of cartel conduct. Samsung  
8 had the highest market share throughout this time period, yet did not respond to the decline in its  
9 market share, focusing instead on growing at market growth levels.

10           109.   At the Credit Suisse Annual Technology, Media & Telecom Conference on November  
11 28, 2017, Micron CEO Sanjay Mehrota repeated the industry approach to keep supply growth below  
12 demand growth: "For fiscal year '18, what we have said is, industry supply that growth 20% . . . while  
13 the demand trends I believe will continue to be somewhat stronger than that . . . there may be some  
14 wafer capacity additions but they will remain relatively small."

15           110.   At the Nasdaq Investor Conference on December 6, 2017, Micron's CFO Ernie Maddock  
16 stated: "We are not adding wafers for either technology in 2017. I think if you look at the public  
17 comments of other suppliers they are adding marginal numbers of wafers. But essentially if you look at  
18 the industry in aggregate even at the end of 2018 it's altogether possible for DRAM that the number of  
19 wafers the industry produces is the same or slightly less than it was some years ago." Maddock noted in  
20 response to another question, "if you look at the public commentary of all the industry participants . . . I  
21 think there is a general belief that the industry participants are keenly aware of the fact that the DRAM  
22 market is relatively inelastic and the way you serve that market is by making sure there is adequate, but  
23 not excess supply."

24           111.   By late 2017, in response to Chinese manufacturers looking to enter the market, reports  
25 indicated Samsung would soon increase capacity to lower prices and hurt the entry of Chinese  
26 competitors to the DRAM market. But at its earnings call on January 31, 2018, Samsung again signaled  
27 its expectation to align with the market in terms of bit growth: "In the fourth quarter, our DRAM bit  
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1 growth came in low single-digit and we saw our ASP increase about 10%. In the first quarter, we expect  
 2 the market DRAM bit growth to decline low single-digit and our bit growth will come in similar to that  
 3 of the market. And for 2018, at this point, we expect the DRAM market bit growth to be about 20% and  
 4 our bit growth will also come in similar level.” Samsung attributed the lack of capacity growth to “even  
 5 though the industry has been working very hard to increase supply, there are difficulties because of the  
 6 10-nano class technology being very difficult. Also there are limits in terms of the cleanrooms that are  
 7 available.”

8 **G. Defendants’ Conspiracy Was Successful – DRAM Revenue Grew 76% in 2017**

9 112. The conspiracy was successful. Global DRAM prices rose from June 2016, “on account  
 10 of higher DRAM content in mobile devices and significant under-supply of PC DRAM and a slowdown  
 11 in capacity expansions.” According to reports, DRAM revenue grew 76% in 2017, with Samsung  
 12 reporting a total of \$10.1 billion in DRAM revenue for the fourth quarter of 2017. SK Hynix reported  
 13 fourth quarter DRAM revenue of \$6.3 billion, while Micron reported \$4.6 billion in DRAM revenue for  
 14 the same period. Industry reports credited this “near-historic high market spike” to “a lack of major fab  
 15 expansion plans, yield difficulties with leading-edge . . . processes, demand for high performance  
 16 (graphics) DRAM from gaming systems and data center-based server applications, and increased  
 17 average content for mobile DRAM used in smartphones.” Industry reports noted that “most PC OEMs  
 18 negotiated first quarter DRAM contracts at the end of 2016, when DRAM was in tight supply. Not only  
 19 did these price increases affect PC DRAM but they also spilled over into the server and mobile DRAM  
 20 markets, increasing the price of mobile DRAM products by nearly 10 percent on average . . .”

21 113. As the prices for DRAM increased, Defendants’ revenue soared, rising more than 50%  
 22 during the Class Period. Between Q1 2016 and Q3 2017, Defendants’ revenues from global DRAM sales  
 23 more than doubled. In Q3 2017, Samsung achieved a record-high revenue of \$8.7 billion from its global  
 24 DRAM sales (Q1 2016 revenue was \$3.9 billion); SK Hynix achieved record-high revenue of \$5.5 billion  
 25 from its global DRAM sales (Q1 2016 revenue was \$2.3 billion), and Micron achieved record-high  
 26 revenue of \$4.0 billion from its global DRAM sales (Q1 2016 revenue was \$1.5 billion). In Q1 2018, all  
 27 of these top three suppliers have pushed their respective operating margins to 50-70%, the highest  
 28

recorded in the history of their companies.

**H. Chinese Regulators Began Investigating the DRAM Industry in Late 2017**

114. By late December 2017, foreign regulators had started to investigate the DRAM industry.

115. On December 26, 2017, an official from China's National Development and Reform Commission ("NDRC") Pricing Supervision Department stated to the China Daily newspaper, "We have noticed the price surge [in the last 18 months] and will pay more attention to future problems that may be caused by 'price fixing' in the sector." On February 1, 2018, Samsung and the NDRC reportedly entered into a Memorandum of Understanding where Samsung agreed to increase manufacturing capacity.

116. In April 2018, SK Hynix publicly announced that it was adding wafer capacity by 6-7% per year in order to meet demand growth.

117. On May 24, 2018, antitrust officials from China's Anti-Monopoly Bureau of the Ministry of Commerce met with Micron to "express concerns" about continued price increases for PC DRAM products.

118. China's State Administration for Market Regulation ("SAMR")<sup>1</sup> carried out surprise inspections of Samsung, SK Hynix, and Micron, at their Beijing, Shanghai, and Shenzhen offices on or around May 31, 2018.

119. On June 1, 2018, Bloomberg News reported that Micron had confirmed it is cooperating with SAMR, who visited Micron's China sales offices on May 31, 2018.

120. On June 4, 2018, Bloomberg News reported that Samsung had confirmed that investigators from China's regulatory agency visited their Chinese sales office on May 31, 2018. SK Hynix said separately it was being investigated by China's government and was cooperating. South

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<sup>1</sup> In March 2018, the Chinese government consolidated the duties of its three competition agencies into a new government agency to handle all antitrust matters. The National Development and Reform Commission ("NDRC") was responsible for investigating price related monopoly agreements, abuse of dominance and abuse of administrative power. The State Administration for Industry and Commerce ("SAIC") was in charge of investigations into non-price related monopoly agreements and abuse. The Ministry of Commerce ("MOFCOM") handled merger control filings. The NDRC, SAIC, and MOFCOM were all consolidated into a new government agency, the State Administration for Market Regulation ("SAMR"), the agency that raided Defendants' offices.

1 Korean media reported that China was accusing the Defendants of colluding with each other to hike  
2 memory chip prices.

3 **I. Trade Associations Provided Further Opportunities for Defendants to Conspire**

4 121. Trade associations provided opportunities for Defendants to meet frequently and  
5 exchange information to facilitate collusion. Defendants are members of a number of trade associations  
6 in the United States, Asia and Europe. Their common membership in trade associations also provided an  
7 incentive for Defendants to adhere to their agreements, as they could monitor one another's activities in  
8 the DRAM market and punish non-compliance. Defendants' participation in trade associations, as  
9 described below, helped facilitate their collusion.

10 122. **Semiconductor Industry Association ("SIA"):** SIA is an association for the U.S.  
11 semiconductor industry. Micron is a member of SIA, along with other U.S. semiconductor  
12 manufacturers. Samsung and SK Hynix are listed as international members. Sanjay Mehrotra, Micron's  
13 President and CEO is on the Board of SIA. The U.S. based SIA is affiliated with branches in other  
14 regions of the world including in Korea, Japan, China, and Europe. It is also linked to the World  
15 Semiconductor Trade Statistics Organization and the World Semiconductor Council. Defendants belong  
16 to all of these associations.

17 123. SIA holds various events, such as its "Annual Award Dinner" which Defendants' key  
18 executives attend. For example, at its annual dinner on November 14, 2017, Mark Durcan, Micron's  
19 then-CEO, was featured as an award winner and potential speaker. The program of events for the  
20 November 14, 2017 meeting also included a CEO Reception and a Post-Party, providing further  
21 opportunities for social interaction or side conversations among members.

22 124. **Korean Semiconductor Industry Association ("KSIA"):** Like SIA, KSIA provides  
23 opportunities for the Defendants to be in contact and to directly communicate and share competitive  
24 information with one another.

25 125. KSIA's membership list includes both SK Hynix and Samsung on its device  
26 manufacturer member list, with only four other entities listed as device manufacturer members. This  
27 small number of member companies, makes it possible for members to be in contact and exchange  
28

1 information.

2 126. In March 2016, Sung Wook Park, the CEO and Vice Chairman of SK Hynix was  
3 inducted as the ninth President of KSIA.

4 127. KSIA also holds events and conferences for its members. For example, KSIA holds an  
5 annual meeting each year. SK Hynix has been noted as one of the event organizers for, at least, the 2016  
6 annual meeting.

7 128. KSIA is connected to SIA and other country-specific branch organizations. At times, the  
8 various country affiliates gather for worldwide conferences and events, providing further opportunities  
9 for Defendants to join together in person.

10 129. While much of the information on these organizations is kept private for members only,  
11 these organizations clearly provide a channel through which Defendants had the opportunity to discuss  
12 and/or exchange information directly during the Class Period.

13 130. **World Semiconductor Council (“WSC”)**: The World Semiconductor Council  
14 “promotes international cooperation in the semiconductor sector in order to facilitate the healthy growth  
15 of the industry from a long-term global perspective.” WSC holds at least one meeting a year. For  
16 example, in May 2018, it held its World Semiconductor Council Meeting for WSC members only in  
17 Coronado, California. Notably, WSC held a meeting of over 100 CEOs and other semiconductor  
18 executives on May 26, 2016 (a few days before the start of the Class Period on June 1, 2016). The  
19 conference was led by Sung Wook Park (CEO of SK Hynix and President of KSIA).

20 131. **World Semiconductor Trade Statistics Organization (“WSTS”)**: Defendants also  
21 participate in WSTS, a non-profit, which provides semiconductor market data and forecasts. WSTS  
22 compiles monthly sales numbers for the semiconductor industry, including DRAM, and provides twice-  
23 yearly semiconductor industry forecasts with quarterly and annual projections. A subscription to the  
24 WSTS Database also includes statistics on Semiconductor Capacity Utilization (known as SICAS  
25 Reports). WSTS is primarily funded by membership fees of participating semiconductor companies,  
26 whose representatives form the WSTS Committee. The members of this Committee submit accurate and  
27 authentic monthly revenue data, attend regional meetings, and contribute to the generation of world  
28

1 semiconductor industry forecasts.

2 132. Semiconductor companies that seek to be WSTS members must agree to provide member  
3 company revenue data and pay membership fees. Members then can access all the information that  
4 WSTS provides. If a company is unable to provide revenue data into the WSTS statistics program, it can  
5 buy access as a subscriber.

6 133. All three Defendants are members of WSTS. Micron is a member of the Americas  
7 Regional Group, and Samsung and SK Hynix are members of the Asia Pacific Regional Group.

8 134. Several partners support WSTS in the operation of market statistics information  
9 services. Data Collection Agents (“DCAs”) receive the revenue data from WSTS member companies  
10 and keep this data under their custody. WSTS has appointed regional DCAs who collect revenue data  
11 from member companies and consolidate this data into the regional base report. Regional DCAs  
12 forward the regional base report at defined dates to the worldwide DCA. The worldwide DCA  
13 consolidates all the data of the regional base reports and merges this data with non-participant estimates  
14 that are provided by WSTS. DCAs are also responsible for checking the submitted data for  
15 completeness, consistency and plausibility. They resolve any perceived data anomalies with the  
16 submitting member companies. Finally, the worldwide DCA posts these data compilations under the  
17 name of the various market statistics reports on the WSTS Internet Portal.

18 135. Semiconductor Industry Associations in the different regions closely cooperate with  
19 WSTS. In most cases they also hold distribution licenses for WSTS market statistics reports and  
20 forecasts to serve interested parties outside the WSTS membership.

21 136. In addition, WSTS holds meetings for its members. For example, it will hold its spring  
22 2018 Committee Meeting in Vienna, Austria. As explained on its meeting registration page, “each  
23 WSTS Member Company has one official representative in the Committee, who is expected to  
24 participate in the Committee Meeting.” Participation in the Forecast Meeting is subject to the  
25 submission of a pre-meeting forecast. The process includes companies submitting their forecast  
26 information and then publication of the pre-meeting average forecast to all participating companies.

27 137. WSTS describes the value of its regular meetings as “an important venue for members to  
28

1 help shape forecasts and future reports, and to interact with their industry peers. . . . Members are able to  
 2 exchange experiences with other market participants, gain important information about current market  
 3 sentiment, and hear directly from their peers how they view the future direction of the market.”

4 138. WSTS holds a number of different types of meetings for members, including: Board of  
 5 Directors Meetings (at least twice a year); Executive Committee Meetings, including the World  
 6 Chairman and the five Regional Chairs (at least twice a year); Working Group Meetings where certain  
 7 WSTS members gather in regional or sector-specific groups; Committee Meetings where members’  
 8 primary focus is to review the current situation in the semiconductor market and to formulate forecasts  
 9 for the upcoming quarters and following two years (twice a year); and Regional Chapter Meetings (two  
 10 to four times per year).

11 139. **Global Semiconductor Alliance (“GSA”):** GSA represents about 350 member  
 12 companies, including Micron, Samsung, and SK Hynix. GSA holds a Memory Conference once every  
 13 two years. For example, the conference was held in March 2015 and June 2017. GSA also holds an  
 14 annual U.S. Executive Forum conference in September or October, an annual European Executive  
 15 Forum in April, May, or June, and an Annual Awards Dinner in December.

#### 16 **J. The DRAM Industry Has A History of Collusive Activity**

17 140. The United States Department of Justice (“DOJ”) brought criminal charges against the  
 18 Defendants (and other makers of DRAM that existed at the time) in 2005, for conspiring to fix the prices  
 19 of DRAM sold in the United States between 1999 and 2002. Samsung and SK Hynix<sup>2</sup> pleaded guilty to  
 20 the DOJ’s charges, paying some of the largest criminal fines in history for their illegal conduct. Micron  
 21 also admitted to participating in the conspiracy, but received amnesty from prosecution in exchange for  
 22 its cooperation under the DOJ’s Antitrust Corporate Leniency Program. The DOJ imposed a \$185 million  
 23 criminal fine on SK Hynix in 2005, the fourth largest criminal antitrust fine at that time. That same year,  
 24 Samsung agreed to plead guilty and paid a \$300 million fine. Samsung’s fine was the second largest  
 25 criminal antitrust fine in U.S. history and the largest criminal fine imposed since 1999 at that time.

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26  
 27 <sup>2</sup> In 2005, at the time of the DOJ investigation, SK Hynix was known as Hynix Semiconductor Inc. For  
 28 consistency, Plaintiff uses “SK Hynix” in this section, although the company did not change its name to  
 SK Hynix until 2012.

1 Fourteen individual employees of Defendants also pleaded guilty for participating in the conspiracy. They  
2 paid fines of \$250,000 each and served prison sentences ranging from seven to fourteen months. Some  
3 of Defendants' employees involved in the collusive acts of the last DRAM conspiracy still hold key  
4 leadership positions with Defendants today. Defendants' previous convictions for conspiring to fix  
5 DRAM prices support the plausibility of the conspiracy alleged in this complaint.

6 141. The DOJ has also investigated Defendants for price fixing in similar semiconductor  
7 memory markets, including the markets for static random access memory ("SRAM") and NAND  
8 (generally referred to as "Flash"). Defendant Samsung and its wholly-owned subsidiaries pleaded guilty  
9 in a number of other related electronic component price-fixing conspiracies.

### 10 **VIII. VIOLATIONS ALLEGED**

11 142. Plaintiff incorporates and realleges, as though fully set forth herein, each and every  
12 allegation set forth in the preceding paragraphs of this complaint.

13 143. Beginning at least as early as June 1, 2016, the exact date being unknown to Plaintiff,  
14 Defendants, by and through their officers, directors, employees, agents, or other representatives, entered  
15 into a continuing contract, combination, or conspiracy to unreasonably restrain trade and commerce in  
16 violation of Section 1 of the Sherman Act, 15 U.S.C. § 1.

17 144. Defendants, by their unlawful conspiracy, artificially raised, inflated and maintained the  
18 market price of DRAM as herein alleged.

19 145. The contract, combination, or conspiracy consisted of a continuing agreement,  
20 understanding, and concert of action among Defendants and their co-conspirators, the substantial terms  
21 of which were to fix, raise, maintain, and stabilize the prices of, and/or allocate the market for, DRAM  
22 they sold in the United States.

23 146. For the purpose of formulating and effectuating their contract, combination or  
24 conspiracy, Defendants and their co-conspirators did those things they contracted, combined or  
25 conspired to do, including:

- 26 a. Participating in meetings and conversations to discuss the prices of and/or supply for  
27 DRAM;  
28



- b. Agreeing to manipulate prices and supply so as to boost DRAM sales in a manner that deprived direct purchasers of free and open competition;
- c. Coordinating the restriction of DRAM capacity in the market; and
- d. Selling DRAM to customers in the United States at non-competitive prices.

147. As a direct result of the unlawful conduct of Defendants and their co-conspirators in furtherance of their continuing contract, combination or conspiracy, Plaintiff and other members of the class have been injured in their business and property in that they have paid more for DRAM than they would have paid in the absence of Defendants' price-fixing.

#### **IX. EFFECTS**

148. The above combination and conspiracy has had the following effects, among others:

- a. Price competition in the sale of DRAM by Defendants and their co-conspirators has been restrained, suppressed and eliminated throughout the United States;
- b. Prices for DRAM sold by Defendants have been raised, fixed, maintained, and stabilized at artificially high and noncompetitive levels through the United States; and
- c. Direct purchasers of DRAM from Defendants have been deprived of the benefit of free and open competition in the purchase of DRAM.

149. As a direct and proximate result of the unlawful conduct of Defendants, Plaintiff and other members of the class have been injured in their business and property in that they paid more for DRAM than they otherwise would have paid in the absence of the unlawful conduct of Defendants.

#### **X. DAMAGES**

150. During the Class Period, Plaintiff and other members of the class purchased DRAM directly from Defendants, or their subsidiaries, agents, and/or affiliates, and, by reason of the antitrust violations alleged herein, paid more for such products than they would have paid in the absence of such antitrust violations. As a result, Plaintiff and the other members of the class have sustained damages to their business and property in an amount to be determined at trial.

#### **XI. PRAYER FOR RELIEF**

WHEREFORE, Plaintiff seeks judgment against Defendants as follows:



1           1.       That the Court determine that this action may be maintained as a class action under Rule  
2 23(b)(3) of the Federal Rules of Civil Procedure, that Plaintiff be certified as class representative, and  
3 Plaintiff's counsel be appointed as counsel for the Class;

4           2.       That the unlawful contract, combination or conspiracy alleged be adjudged and decreed  
5 to be an unreasonable restraint of trade or commerce in violation of Section 1 of the Sherman Act;

6           3.       That Plaintiff and the Class recover damages, as provided by law, determined to have  
7 been sustained as to each of them, in an amount to be trebled in accordance with the antitrust laws, and  
8 that judgment be entered against Defendants on behalf of Plaintiff and the Class;

9           4.       That Plaintiff and the Class recover their costs of suit, including reasonable attorneys'  
10 fees, as provided by law;

11          5.       That Defendants, their subsidiaries, affiliates, successors, transferees, assignees and the  
12 respective officers, directors, partners, agents, and employees thereof and all other persons acting or  
13 claiming to act on their behalf be permanently enjoined and restrained from continuing and maintaining  
14 the combination, conspiracy, or agreement alleged herein;

15          6.       That Plaintiff and the Class be awarded pre-judgment and post-judgment interest, and  
16 that such interest be awarded at the highest legal rate from and after the date of service of the initial  
17 complaint in this action; and

18          7.       For such other and further relief as is just under the circumstances.

19 **XII. DEMAND FOR JURY TRIAL**

20          Pursuant to Federal Rule of Civil Procedure 38(b), Plaintiff demands a trial by jury of all of the  
21 claims asserted in this complaint that are so triable.

22  
23 Dated: June 26, 2018

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**ATTESTATION**

I, R. Alexander Saveri, hereby attest, pursuant to Civil Local Rule 5-1(i)(3), that concurrence in the filing of this document has been obtained from all signatories.

/s/ R. Alexander Saveri  
R. Alexander Saveri